

### **WHAT IS CLAIMED IS:**

1. An adjustable chair comprising a support frame, an adjustable seat assembly secured to said support frame, an adjustable backrest assembly secured to a back support frame, said adjustable backrest assembly having displaceable back support elements, backrest adjustment means to adjustably secure said back support elements to a desired position to adjust the vertical length of said backrest, said backrest having a back cushion secured thereto, said back cushion being secured to a cushion extension and retraction mechanism to retract or extend a portion of said cushion in synchronism with said back support elements as said back support elements are displaced along said back support frame to retract or extend said backrest assembly lengthwise, said adjustable seat assembly having a pair of laterally displaceable seat panels each secured to a common laterally displacing mechanism operable to displace said panels to or away from one another in unison to provide equal lateral adjustment of said adjustable seat on opposed sides of a central plane aligned with said backrest, said adjustable seat assembly also having a displaceable front guide frame provided with a seat depth adjustable mechanism to extend and retract said front guide frame, and a seat cushion having opposed lateral sections extendable or retractable with the displacement of said seat panels and a frontal section extendable or retractable in unison with the displacement of said front guide frame.
2. An adjustable chair as claimed in claim 1 wherein said backrest adjustment means, said laterally displaceable mechanism and said seat depth adjustable mechanism have a linear drive mechanism for quick adjustment of said backrest assembly and adjustable seat assembly for comfort fit to a user person.
3. An adjustable chair as claimed in claim 1 wherein said adjustable backrest assembly has a vertical support column, one of said back support elements being a lower back plate secured to said support column, said lower back plate having a lower cushion guide portion about which said backrest cushion may be displaced.

4. An adjustable chair as claimed in claim 3 wherein a further of said back support elements also comprises a displaceable central back plate displaceably secured to said vertical support column for vertical displacement therealong and a displaceable top back plate.
5. An adjustable chair as claimed in claim 4 wherein said central back plate and said top back plate have an independent one of said adjustment means.
6. An adjustable chair as claimed in claim 5 wherein said top back plate and said lower back plate are hingedly mounted, and each have independent locking means to arrest said lower back plate and said top back plate at a desired hinged position along said vertical support column.
7. An adjustable chair as claimed in claim 4 wherein said top back plate is a shoulder backrest plate and adjustable hinge connectors interconnecting said shoulder backrest plate and said lower back plate to said support column whereby to tilt said shoulder backrest plate and said lower back plate forwardly on a vertical plane of said backrest assembly.
8. An adjustable chair as claimed in claim 5 wherein said vertical support column is a central support column, said adjustment means being elongated threaded rods secured between stationary connecting brackets, one of said brackets being in threaded engagement with its associated rod, said threaded rods having a rotatably displaceable drive element at one end thereof to impart rotation of said rods whereby to cause displacement of said central back plate or said top back plate.
9. An adjustable chair as claimed in claim 8 wherein said rotatably displaceable drive element is a power tool engaging chuck adapted for rotatable engagement by a power tool.
10. An adjustable chair as claimed in claim 8 wherein said rotatably displaceable drive element is a hand operable knob.
11. An adjustable chair as claimed in claim 3 wherein said adjustable backrest assembly further comprises an adjustable upper side body restraining assembly, said upper side body restraining assembly having vertically supported side pads

- adjustably secured on opposed sides of said backrest, each said side pad having a mounting bracket secured to a horizontally displaceable support arm whereby to adjust the spacing of each of said side pads relative to said central plane.
12. An adjustable chair as claimed in claim 11 wherein said horizontally displaceable support arm of each of said side pads are interconnected together by a common side pad adjustment mechanism to displace said side pads simultaneously towards or away from one another on respective sides of said central plane.
  13. An adjustable chair as claimed in claim 12 wherein said side pad adjustment mechanism includes a threaded rod having a rotatably displaceable drive element at one end thereof to impart rotation thereof whereby to effect said displacement of said pads.
  14. An adjustable chair as claimed in claim 11 wherein said side pads are interchangeable side pads, said mounting bracket being an adjustable mounting bracket to provide vertical adjustment of said side pads
  15. An adjustable chair as claimed in claim 6 wherein said independent locking means comprises an interconnecting rod secured at one end to a bracket attached to one of said lower back plate or said top back plate and to said vertical support column and a brake mechanism actuable by said interconnecting rod to lock and unlock said hinge mechanism to permit their hinge adjustment.
  16. An adjustable chair as claimed in claim 1 wherein one of said back support elements is a stationary lower back plate secured to said support column, said lower back plate having a lower cushion guide portion about which said backrest cushion is displaced by said cushion extension and retraction mechanism.
  17. An adjustable chair as claimed in claim 16 wherein said cushion extension and retraction mechanism is a cable and pulley mechanism having a cable thereof secured at one end thereof to a free lower end of said backrest cushion and at an opposed end to a vertically displaceable back support element, said cable being trained about a pulley secured to a stationary frame member, there being a cable and pulley mechanism for each said displaceable back support element.
  18. An adjustable chair as claimed in claim 17 wherein said lower cushion guide

portion is an arcuately shaped lower section of said lower back plate extending rearwardly of said backrest to guide a lower portion of said backrest cushion behind said backrest in close proximity to a rear end of said seat cushion.

19. An adjustable chair as claimed in claim 1 wherein said adjustable seat assembly further comprises pelvis stabilizing pads disposed on each side of said seat cushion and above a top surface thereof, said pelvis stabilizing pads being removably securable to an armrest support frame.
20. An adjustable chair as claimed in claim 19 wherein an armrest is adjustably securable in height to said armrest support frame.
21. An adjustable chair as claimed in claim 1 wherein said pair of laterally displaceable seat panels are displaceable over a lower central seat panel whereby to provide a solid support surface regardless of the position of said laterally displaceable seat panels.
22. An adjustable chair as claimed in claim 21 wherein said displaceable front guide frame is secured to said lower central seat panel by a pair of spaced rigid guide rods to substantially prevent flexing of said front guide frame and a drive rod connected at one end to said front guide frame and in threaded engagement with a stationary frame member to displace said front guide frame.
23. An adjustable chair as claimed in claim 21 wherein said lower central seat panel is concavely V-shaped and, together with said laterally displaceable seat panels, constitutes a concave seat support.
24. An adjustable chair as claimed in claim 21 wherein said laterally displaceable seat panels are secured respectively to a seat panel support frame member, displacement means to adjust the position of said laterally displaceable seat panels, said opposed lateral sections of said seat cushion being secured respectively at a free end thereof to a seat cushion cable and pulley mechanism having a cable thereof secured at one end to said free end and at an opposed end to a respective one of said laterally displaceable seat panels, said cable being trained about a pair of stationary guide pulleys.
25. An adjustable chair as claimed in claim 22 wherein said frontal section of said seat

cushion is secured at a free end thereof to a first end of a cable of a cable and pulley mechanism, a second end of said cable being secured to said front guide frame and trained about a pair of stationary pulleys.

26. An adjustable chair as claimed in claim 1 wherein said adjustable chair is a wheelchair for handicapped persons, said wheelchair having opposed wheels equipped with push rims and secured on opposed sides of said adjustable seat assembly.
27. An adjustable chair as claimed in claim 26 wherein said support frame has a telescoping transverse connecting member which is adjustable in length to adjust the lateral spacing between said opposed wheels.
28. An adjustable chair as claimed in claim 26 wherein each of said opposed wheels has an axel which is selectively secured to a multi-position connection of a mounting plate, each mounting plate being secured to said support frame and having a front caster support slidably secured to an inclined ramp of said mounting plate to provide a position adjustment for front casters of said front caster support relative to said seat assembly whereby to permit a user person to touch a floor support surface with its feet.
29. An adjustable chair as claimed in claim 28 wherein each said mounting plate is provided with a plurality of connecting bores to receive a respective one of said axel for securement thereto, said connecting bores permitting said wheels to be adjustably secured in a forward and rearward direction as well as in an upward or downward direction.
30. An adjustable chair as claimed in claim 28 wherein there is further provided a seat assembly tilting mechanism to displace said seat assembly along a gravity axis of said wheels, said gravity axis extending vertically and aligned with axels of said wheels.
31. An adjustable chair as claimed in claim 30 wherein said tilting mechanism comprises a pair of sliding guide plates secured to a respective side of a seat support frame, each sliding guide plate having a frontal horizontal slot and a rearwardly upward extending rear slot, each sliding guide plate being displaceably

connected to a respective mounting plate secured to said support frame by a pair of fastener bolts secured to said mounting plate and extending through a respective one of said frontal horizontal slot and said rear slot, and arresting means to immobilize said sliding guide plates at a desired position relative to said mounting plates.

32. An adjustable chair as claimed in claim 31 wherein said arresting means is constituted by a locking cylinder secured between an immovable frame member and a respective one of said sliding guide plates and actuating means to unlock said cylinder to position said seat assembly at a desired position.
33. An adjustable chair as claimed in claim 32 wherein said actuating means is a foot pedal actuator disposed spaced under said seat frame behind said wheelchair.
34. An adjustable chair as claimed in claim 28 wherein said front caster support is a support rod having an end connector formed integral therewith and configured to be retained captive and in sliding relationship in a connecting slot of said ramp of said mounting plate, said ramp being a rearwardly upward extending straight front edge of said mounting plate, and means to secure said end connector at a desired position along said connecting slot.
35. An adjustable chair as claimed in claim 34 wherein said means to secure is comprised of a fastener disposed in a selected one of a plurality of spaced apart bores formed in a side wall of said connecting slot and extending into a connecting bore of said end connector.
36. An adjustable chair as claimed in claim 1 wherein there is further provided adjustable leg positioning means secured to a slider bar secured under said front guide frame and one or more leg restraining members secured to said slider bar through a respective locking sliding bracket to position said one or more leg restraining members at a desired location over said frontal section of said seat cushion, said wheelchair being a paraplegic wheelchair.
37. An adjustable chair seat comprising a seat support frame, a pair of laterally displaceable seat panels each secured to a common laterally displacing mechanism operable to displace said panels to or away from one another in

unison to provide equal lateral adjustment of said adjustable seat on opposed sides of a central plane aligned with said backrest, said adjustable seat assembly also having a displaceable front guide frame provided with a seat depth adjustable mechanism to extend and retract said front guide frame and a seat cushion having opposed lateral sections extendable or retractable with the displacement of said seat panels and a frontal section extendable or retractable in unison with the displacement of said front guide frame.

38. An adjustable chair seat as claimed in claim 37 wherein said laterally displaceable mechanism and said seat depth adjustable mechanism have a linear drive mechanism for quick adjustment of said seat panels and front guide frame to customize said chair seat to an intended user person.
39. An adjustable chair seat as claimed in claim 37 wherein said pair of laterally displaceable seat panels are displaceable over a lower central seat panel whereby to provide a solid support surface regardless of the position of said laterally displaceable seat panels.
40. An adjustable chair seat as claimed in claim 39 wherein said displaceable front guide frame is secured to said lower central seat panel by a pair of spaced rigid guide rods to substantially prevent flexing of said front guide frame and a drive rod connected at one end to said front guide frame and in threaded engagement with an immovable frame member to displace said front guide frame.
41. An adjustable chair seat as claimed in claim 39 wherein said lower central seat panel is concavely V-shaped and, together with said laterally displaceable seat panels, constitutes a concave seat support.
42. An adjustable chair seat as claimed in claim 39 wherein said laterally displaceable seat panels are secured respectively to a seat panel support frame member, displacement means to adjust the position of said laterally displaceable seat panels, said opposed lateral sections of said seat cushion being secured respectively at a free end thereof to a seat cushion cable and pulley mechanism having a cable thereof secured at one end to said free end and at an opposed end to a respective one of said laterally displaceable seat panels, said cable being

trained taunt about a pair of stationary guide pulleys.

43. An adjustable chair seat as claimed in claim 40 wherein said frontal section of said seat cushion is secured at a free end thereof to a first end of a cable of a cable and pulley mechanism, a second end of said cable being secured to said front guide frame and trained about a pair of stationary pulleys.
44. An adjustable chair seat as claimed in claim 37 in combination with an adjustable backrest assembly secured to a back support frame, said backrest assembly having displaceable back support elements, backrest adjustment means to adjustably secure said back support elements to a desired position to adjust the vertical length of said backrest, said backrest having a back cushion secured thereto, said back cushion being secured to a cushion extension and retraction mechanism to retract or extend a portion of said cushion in synchronism with said back support elements as said back support elements are displaced along said back support frame to retract or extend said backrest assembly lengthwise.
45. An adjustable chair seat as claimed in claim 44 wherein said back support frame is a vertical support column, one of said back support elements being a lower back plate secured to said support column, said lower back plate having a lower cushion guide portion about which said backrest cushion may be displaced.
46. An adjustable support base assembly for a wheelchair, said assembly comprising a multi-position wheel mounting plate secured to a support frame for securing axels of opposed wheels to said frame at a desired position, each mounting plate being secured to the support frame and has a front caster support slidably secured to a connecting ramp of said mounting plate to provide a position adjustment for front casters of said front caster support relative to said seat assembly whereby to permit a user person to touch a floor support surface with its feet.
47. An adjustable support base assembly as claimed in claim 46 wherein each said mounting plate is provided with a plurality of connecting bores to receive a respective one of said axel for securement thereto, said connecting bores permitting said wheels to be adjustably secured in a forward and rearward



direction as well as in an upward or downward direction.

48. An adjustable support base assembly as claimed in claim 46 wherein there is further provided a seat assembly tilting mechanism to displace said seat assembly along a gravity axis of said wheels, said gravity axis extending vertically and aligned with axels of said wheels.
49. An adjustable support base assembly as claimed in claim 48 wherein said tilting mechanism comprises a pair of sliding guide plates secured to a respective side of a seat support frame, each sliding guide plate having a frontal horizontal slot and a rearwardly upward extending rear slot, each sliding guide plate being displaceably connected to a respective mounting plate secured to said support frame by a pair of fastener bolts secured to said mounting plate and extending through a respective one of said frontal horizontal slot and said rear slot, and arresting means to immobilize said sliding guide plates at a desired position relative to said mounting plates.
50. An adjustable support base assembly as claimed in claim 49 wherein said arresting means is constituted by a locking cylinder secured between an immovable frame member and a respective one of said sliding guide plates and actuating means to unlock said cylinder to position said seat assembly at a desired position.
51. An adjustable support base assembly as claimed in claim 50 wherein said actuating means is a foot pedal actuator disposed spaced under said seat frame behind said wheelchair.
52. An adjustable support base assembly as claimed in claim 46 wherein said front caster support is a support rod having an end connector formed integral therewith and configured to be retained captive and in sliding relationship in a connecting slot of said ramp of said mounting plate, said ramp being a rearwardly upward extending straight front edge of said mounting plate and means to secure said end connector at a desired position along said connecting slot.
53. An adjustable support base assembly as claimed in claim 52 wherein said means to secure is comprised of a fastener disposed in a selected one of a plurality of

spaced apart bores formed in a side wall of said connecting slot and extending into a connecting bore of said end connector.